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Multidimensional health locus of control and values: An integrated approach to understanding preventive health behavior.

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MULTIDIMENSIONAL HEALTH LOCUS OF CONTROL AND VALUES: AN INTEGRATED APPROACH TO UNDERSTANDING PREVENTIVE HEALTH BEHAVIOR.

by

WILLIAM GORDON KREUTZWEISER

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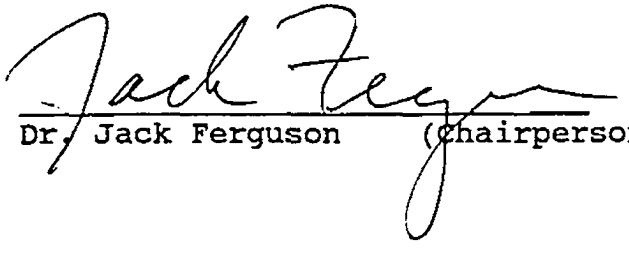

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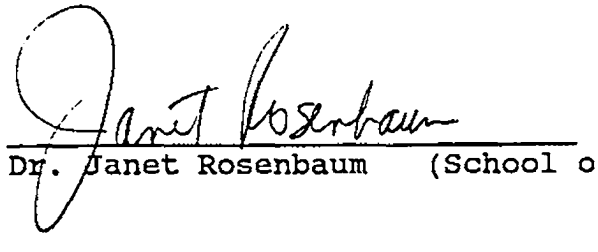

Dr. Janet Rosenbaum (School of Nursing)

ABSTRACT

This study examined the relationships between health locus of control, health value, and preventive health behaviors among a relatively healthy sample of undergraduate students in Windsor, Ontario (N=365). Students responded to a wide variety of variables. The analyses examined the Multidimensional Health Locus of Control scale, the value of health relative to other desirable aspects of life and a measure of Preventive Health Behavior, as well as several demographic variables. Descriptive and bivariate analyses were carried out in an attempt to understand Preventive Health Behavior.

The hypothesis that health locus of control would be a predictor of preventive health value was not supported by the findings of this research. It was, also, hypothesized that gender and academic area of concentration would be significantly associated with preventive health behaviors. It was found that males differ from females in their practice of eating habits and weight watching. And that science students differed greatly on a measure of relaxation compared to non-science students. As well, the subject's social class appears to play a role in the practice of certain health behaviors. These findings and the limitations of using a undergraduate sample are discussed.

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CHAPTER I

INTRODUCTION

The popularity of health and fitness in the 1980's brought about an increase in research examining health and general lifestyle practices. Such research in the 1990's has continued to increase and receive support. It is being encouraged because of the recognized importance of being able to predict lifestyle behaviors that are classified as preventive measures against a variety of illness and disease.

Research continues to link a person's lifestyle with good health, such associations include never smoking, regular physical exercise, and sleeping an average of seven to eight hours nightly (Abella and Heslin, 1984; Wurtele, Britcher, and Saslawsky, 1985; Wallston and Wallston, 1981). An understanding of these health practices has led researchers to attempt to predict such health enhancing behaviors. The ability to predict such behaviors is of importance to those in health care professions and essential to developing effective health care policy.

Research studying health behaviors in relation to perceived control over one's health has shown moderate to significant associations. Abella and Heslin (1984) suggest that one's perceived control of their health has become a common and increasingly important factor in analyzing health

outcomes. This has developed from general notions of locus of control which indicated that beliefs of control "develop from specific experiences and past reinforcement history" (Lau, 1982:322). It has also been suggested that when an individual values health highly, perceived control of health should function as a significant predictor of health outcome (Wallston and Wallston, 1981; Abella and Heslin, 1984).

The following discussion specifically examines both the predictive ability of a person's value of health, and a person's perceived Health Locus of Control, with respect to a measure of Preventive Health Behavior. These three constructs form the basis of the present research. The hypothesis for this study, to be introduced later, will suggest that, only under high health value, will the construct of Health Locus of Control be a significant predictor of Preventive Health Behavior. To understand better these measures, the following will provide a discussion of the development of the constructs Health Locus of Control, Health Value, and Preventive Health Behavior, as well, current research will be discussed which utilizes these scales.

CHAPTER II

DEVELOPMENT OF THE CONSTRUCTS.

HEALTH LOCUS OF CONTROL. As explained by Wallston and Wallston (1982) health locus of control is a construct measuring the extent to which individuals believe their health is controlled by internal or external factors. The generalized expectancy that a person's health is dependent on his/her behavior is termed internal health locus of control. The following statement is characteristic of this belief: If I get sick, it is my own behavior which determines how soon I get well again (Wallston and Wallston, 1982).

The belief that a person's health status is a result of the control of powerful others or forces of fate, luck or chance is termed external health locus of control. Statements such as the following are characteristic of this belief: 1) Having regular contact with my physician is the best way for me to avoid illness; 2) Most things that affect my health happen to me by accident (Wallston and Wallston, 1982).

The rationale for examining locus of control comes from Social Learning Theory. Essentially, for a behavior to occur in a specific situation that behavior must be expected to lead to a reinforcement (Rotter, 1975). Rotter suggests

that the occurrence of behavior depends on the type and value of reinforcement or reward expected because of that behavior. For example, a person who values better health and who expects an improvement in health as a result of regular contact with a physician will probably visit a physician more often. However, another person might expect better health to result from a strict personal regimen of preventive health behavior. This person will be more or less likely to follow preventive strategies, depending upon the value he/she places on health. These two examples illustrate the two main dimensions of health locus of control: externality and internality.

The original Health Locus of Control Scale, developed by Wallston, Wallston, Kaplan and Maides (1976) was an eleven item measure of a person's belief that his/her behavior could or could not determine his/her health. This scale design was built upon earlier work initiated by Rotter (1966) in which a general measure of locus of control was designed using a forced choice response scale format. Compared to the scales in use today, Rotter's scale was a fairly simple measure of locus of control. However, Rotter's work provides a foundation for most of the current research and scales, measuring locus of control (Wallston and Wallston, 1978).

A Likert-type response format was utilized in the original health locus of control scale, which led to a

simple categorization of cases based on scores. Those respondents scoring high on the scale were known as having an external health locus of control or as being health externals. Those respondents scoring lower on the scale were known as having an internal health locus of control or as being health internals (Wallston and Wallston, 1978).

The health locus of control scale developed by Wallston et al., (1976) was designed to have a balance of questions measuring internality and externality. This scale was considered, in its initial stages, to be internally consistent, with an Alpha reliability of .72 (Wallston and Wallston, 1978). At the time, there appeared to be no consideration of the potential multidimensionality of the construct. Through further research (i.e., performing factor analysis) however, it was discovered that two sub-scales actually existed, clearly measuring an internal and an external locus of control. A correlation of almost zero was observed between these scales, indicating that the items in these two sub-scales were measuring two different factors or dimensions of the construct.

In concurrent work on the general construct of Locus of Control, Levenson (1975) further argued that the external dimension was, in fact, composed of more then one factor. She suggested that external locus of control consists of expectations of being controlled by chance or fate on the one hand and expectations of being controlled by powerful

others on the other. From here, Levenson proceeded to develop three Likert-type sub-scales to assess locus of control, each consisting of eight items. The three sub-scales assess the external Locus of Control dimensions of chance, luck, fate and of powerful others, as well as the single dimension of internality.

Combining the results of Levenson's (1975) work on the general construct of locus of control and their own work on health locus of control, Wallston and Wallston (1982) developed the Multidimensional Health Locus of Control consisting of 18 items assessing all three dimensions of Locus of Control but with specific reference to health (See Appendix A). The response format was a Likert-type response scale, using a scoring scale of 1 to 6 (from strongly agree to strongly disagree). Alpha reliabilities of .67 to .77 were measured for the MHLC scale.

With respect to the validity of the Multidimensional Health Locus Control scale, little work has been conducted and the issue of reliability is more complex then validity (Wallston and Wallston, 1981). However, the items would appear to be at least face valid.

HEALTH VALUE. It is believed that utilizing a measure of health value will lead to a greater ability to predict more of the variance in individual health behaviors (Wurtele et al., 1985). Furthermore, the argument supporting the use of

a health value measure, along with the health locus of control scale, suggests that there is little theoretical support for health locus of control to predict preventive health behavior, unless a measure of health value is utilized (Wallston, Maides, and Wallston, 1976). These arguments are consistent with the research hypothesis of this study.

Until recently, most research in health locus of control has failed to control for the value placed on health. This is surprising because, as early as 1966, it has been suggested that the value of reinforcement (i.e., health) must be considered (Rotter, 1975). Perhaps the absence of a measure of health value is best explained by Abella and Heslin, (1984:288) who indicate that "desiring or valuing health is not in itself a sufficient condition to produce a healthy lifestyle."

In 1972, Rotter initiated the idea that the value of health could be measured through a ranking procedure and it was Wallston et al. (1976) who modified Rokeach's (1973) Value Survey to include a measure of health value. The health value measure utilized by Wallston et al. (1976) contains ten values that are individually ranked by respondents. Nine of these values (e.g., prosperous life, mature love, etc.) come from Rokeach's (1973) Value Survey and a tenth item that has been added is the value of health. The value of health is described as being free from physical

or mental disease or pain. The full 10 item list appears in Appendix C.

It should be noted that health value is only one of many variables that may influence health behavior. Wurtele et al. point out the complexity of human behavior and suggest that health behavior is even more multifaceted and multidetermined (1985). Even so, health value appears, in the literature, to be most significant when used in combination with health locus of control.

PREVENTIVE HEALTH BEHAVIOR (PHB). Since it is believed that an increase in health enhancing behavior leads to a decrease in disease incidence, the performance of such behavior is encouraged (Harris and Guten, 1979). Such behavior has come to be termed Preventive Health Behavior or Protective Health Behavior.

A number of definitions of the construct have been presented in the literature (Kasl and Cobb, 1966; Harris and Guten, 1979; Abella and Heslin, 1984). This research makes use of the definition offered by Harris and Guten, (1979). This definition attempts to be all-encompassing, by defining preventive health behavior as "any behavior performed by a person regardless of his/her perceived or actual health status, in order to protect, promote, or maintain his/her health, whether or not such behavior is objectively

effective toward that end" (Harris and Guten, 1979:18). Initially preventive health behavior must be distinguished from other health-related behaviors, such as illness behavior or sick role behavior. Kasl and Cobb define health behavior as "any activity undertaken by a person believing himself to be healthy, for the purpose of preventing disease or detecting it in an asymptomatic stage" (1966:246). Most of the research guided by this definition appears to consider only medically approved behaviors, such as physical or dental check ups, immunizations, limiting cholesterol intake, or having regular exercise (Harris and Guten, 1979). This is a very limited approach which does not account for the many health enhancing behaviors which do not fall into the medically definition.

What has been proposed is that preventive health behavior be redefined so it can encompass all health-related behaviors including those that are largely preventive in nature. It is not uncommon to consider that most people engage in some form of behavior that is intended to protect their health. Implicit in this suggestion is the recognition that all people do not necessarily practice medically defined health behaviors.

The all-encompassing definition of preventive health behavior proposed by Harris and Guten (1979) suggests that there are many behaviors that may be influential in protecting and promoting one's health. Yet, problems arise

in attempting to provide an operational definition of this conceptual definition. Using the more restricted 'medically approved' definition leads to a fairly easy checklist type of measure, since the behaviors at issue are well known and universally accepted. The broader conceptualization suggested by Harris and Guten (1979) requires more than simple checklists because the behaviors are more likely to reflect individual preferences and practices. In an effort to measure the construct, they developed a thirty item scale using a Likert-type response format that has been adopted for this study (For a complete list of the thirty item scale, see Appendix B).

CHAPTER III

DISCUSSION OF THE RELATIONSHIPS AMONG THE CONSTRUCTS.

Current studies of Health Locus of Control and Health Value as predictors of Preventive Health Behaviors have demonstrated a variety of findings, most of which tend to encourage the continuation of research of these relationships. The most promising research has utilized a measure of health value in conjunction with health locus of control to predict preventive health behavior. However, a number of studies have attempted to predict preventive health behavior without accounting for health value, only to produce insignificant results. This type of research has become very common, especially considering the demands put on researchers to publish yet it is an approach that has been unproductive (Wallston and Wallston, 1981).

The purpose of this section of the paper is to discuss research that utilized the scales discussed above, especially research that utilized a measure of health value. Wallston and Wallston (1981) provide a review of several studies that contribute valuable findings to this area of research. Specifically, Baugman's (1978) examination using a measure of health value is a promising example of the type of research desired in this field.

Baughman (1978) used the Multidimensional Health Locus of Control Scale (MHLC) and a measure of health value on a population of female clerical and secretarial staff at The University of Cincinnati, and tested these variables as predictors of Preventive Health Behaviors. The findings suggest that a significant but weak positive relationship exists between Preventive Health Behavior and the dimensions of "internal" and "chance". However, the dimension of "powerful" was not significant (Baughman, 1978). Generally, the findings are consistent with other research that utilizes a measure of Health Value; however, much of this work suffers from similar problems in that many of the studies are unpublished.

McCusker and Morrow (1979) examine a population of teachers and administrators to measure the relationship between Health Locus of Control and preventive behaviors relative to cancer. Health value was measured and no relationship was found alone or in combination with health locus of control as a predictor of any of the specific preventive behaviors (e.g., screening tests, breast self-examinations, etc.).

These findings were unexpected and are explained by the unique homogeneous, upper-middle class population that was studied (McCusker and Morrow, 1979). However, to explain the findings solely on the sample is insufficient, although such results are consistent with research using college

populations. These findings would appear to indicate that such samples fail to be representative of diverse health behaviors. Future research should consider such problems when developing research designs.

As well, McCusker and Morrow suggest that the measures of health behavior may lack validity, based on the assumption that respondents have a tendency to overestimate their cancer prevention activities. This brings the reader to question what exactly has been measured and what has been reported. Also suggesting that more specific and direct measures are necessary in this field of research.

In a different study, Wallston et al. (1976) hypothesized that a person's locus of control beliefs and the value placed on health would be predictors of health related information seeking. It was their expectation that if a person values health and believes health may be influenced by individual behavior, he/she will seek information about a health threatening illness.

The researchers believe that their findings, based on a college population, suggest that health locus of control and health value are significant predictors of information seeking (i.e., information seeking of a little known health condition). However, findings based on a college population must be questioned; for example how many students suffer from little known illnesses.

The variables examined in this study contribute some interesting findings, specifically that information seeking could be predicted using health locus of control and health value. The measuring of specific behaviors (i.e., information seeking) is consistent with the suggestions in the literature that continues to encourage research of this type. However, it appears that the design of research measuring specific behavior needs further development.

In other research, health locus of control was examined as a mediator between health value and social environment as predictors of preventive health behaviors, among a sample of male college students (Abella and Heslin, 1984). It was the authors' findings that health locus of control does mediate the effects that health value and social environment have on preventive health behaviors. However, the researchers noted that valuing health is not enough to ensure healthy behavior.

The authors' suggest that the positive findings of the research emerge because of the general approach taken in defining preventive health behavior. As a dependent variable, preventive health behavior was composed of a number of different, yet related health behaviors that were considered preventive, rather than one specific behavior (e.g., information seeking). The researchers indicate that their comprehensive approach presents a clearer picture of

the actual relationship between preventive health behavior and health.

Further research examining the relationship between health locus of control expectancies, health value, and reported participation in preventive health behaviors, among a sample of undergraduate females, was conducted by Wurtele et al. (1985). It was predicted that participation in preventive health behaviors would be a joint function of internal health locus of control beliefs and holding health in high value; this research hypothesis was not supported. Instead, it was found that respondents' value of health in combination with self-rated health status, proved to be better predictors of health behaviors than their locus of control beliefs.

The findings of this study are disappointing in that they are not consistent with the literature. Yet, such findings suggest that other potential relationships among health value and preventive health behaviors may exist. Overall, the findings are encouraging for further research in this field.

In general, the relationships that have been examined illustrate a variety of findings. The importance of health value was argued by Baughman (1978) in predicting preventive health behaviors with health locus of control. The findings were significant; however, because the research was not published, it proved difficult to examine.

As well, McCusker and Morrow (1979), and Wallston et al. (1978) both provide research examining specific measures of preventive health behavior, that is, preventive behaviors relative to cancer and health related information seeking respectively. McCusker and Morrow failed to find significant results, whereas Wallston et al. demonstrated significant results. The difference between these two studies is evident; yet both make a contribution to this field of research.

Abella and Heslin (1984) produce results similar to Baughman (1978), in that health locus of control and health value were found to be predictors of preventive health behaviors. Yet, Abella and Heslin stated that holding health in high value will not ensure healthy behavior. Further, insignificant findings were found in the study of Wurtele et al. (1985). They suggest other measures of health could possibly be predictors of preventive health behaviors, this is not inconsistent with the literature in this field.

RESEARCH HYPOTHESIS

Based on the above literature, a research hypothesis was formulated for the present study. It is based on Wallston and Wallston (1981) research which indicates that the construct of health locus of control will be a

significant predictor of preventive health behavior, only under conditions of high health value.

It is also expected that health behaviors will differ significantly on gender, and the area of academic concentration of the student.

CHAPTER IV

METHODOLOGY

SAMPLE. The sample for this study is composed of students attending a first year sociology course at the University of Windsor in Windsor, Ontario during the January-April term of 1990. It was determined that the introductory sociology course, like other introductory courses, consist of students registered with the various faculties throughout the university. The concern for representation between the various faculties was based on the assumption that the perceived health locus of control and preventive health behavior would demonstrate differences between science and non-science students.

DATA COLLECTION. A self-administered questionnaire consisting of 80 items, was completed by the sample during the respondents' lecture or tutorial (See Appendix D). The questionnaire, requiring twenty-five to thirty minutes to complete, was distributed and collected by myself, and with some assistants at times. Prior to the administration of the questionnaire permission was obtained from the Professors or instructors whose class time was required.

INSTRUMENTATION AND SCALE DEVELOPMENT

INDEPENDENT VARIABLES:

DEMOGRAPHICS. Subjects responded to a number of demographic variables, including sex, age, marital status, ethnicity, religion place of birth. As well, the students were requested to indicate their academic area of concentration. That is, the specific faculty they were registered with and what area or department they intended to concentrate in. To determine the students social class, subjects responded to questions about their parents education, income and education. These three questions were utilized to compose a measure of the students social economic status (SES). It was possible to calculate the SES measure for all 365 cases when using all three items. This was beneficial considering that almost 16% of the students were unable to respond to the question of parental income.

MULTIDIMENSIONAL HEALTH LOCUS OF CONTROL (MHLC). Subjects responded to the MHLC scale which consists of eighteen items (e.g., If I get sick, it is my own behavior which determines how soon I get well again; Health professionals control my health). A Likert-type response scale was used with potential responses ranging from 1 to 6 (from strongly agree

to strongly disagree). In the present study the Cronbach's coefficient alpha for the MHLC was .61.

A maximum likelihood factor analysis was performed on the eighteen items of the MHLC scale to determine underlying dimensions. The literature and the initial statistics suggest that three distinct dimensions may exist. The factor analysis appears in the table below.

TABLE 1: FACTOR ANALYSIS OF THE MULTIDIMENSIONAL HEALTH LOCUS OF CONTROL SCALE - FINAL STATISTICS.

VARIABLE NAME	COMMUNALITY	FACTOR	EIGENVALUE	% OF VAR
ISICK	.14	1	3.01	16.7
CSICK	.24	2	1.65	9.2
PPHYSI	.31	3	.78	4.4
CACCID	.10			
PPROF	.27			
ICONT	.37			
PFAMIL	.07			
IBLAME	.12			
CLUCK	.31			
PHEAL	.54			
CFORT	.29			
ISELF	.40			
IAVOID	.51			
POTHER	.33			
CMATT	.27			
CWILL	.25			
IACTON	.45			
PDOCT	.48			

TABLE 1: (continued) ROTATED FACTOR MATRIX.

VARIABLE NAME	FACTOR 1 (INTERNAL)	FACTOR 2 (POWER)	FACTOR 3 (CHANCE)
IAVOID	.70		
IACTON	.65		
ISELF	.63		
ICONT	.57		
ISICK	.36		
IBLAME	.32		
PFAMIL	less then .30		
PHEAL		.70	
PDOCT		.61	.31
POTHER		.56	
PPHYSI		.55	
PPROF		.50	
CLUCK			.55
CFORT			.50
CWILL			.47
CMATT			.47
CSICK			.42
CACCID			less then .30

Using the level of eigenvalues as a general indicator, it was found that three factors existed. An eigenvalue of 3.01 was observed in the final statistics, providing further evidence that three factors exist. These three factors or sub-scales are consistent with the findings of most research which utilize the MHLC scale. The three dimensions that have been isolated are noted in the literature as 1. powerful others; 2. chance or fate; 3. internal (Wallston and Wallston, 1981). Reliabilities were calculated for each of these sub-scales: POWERFUL= .75; CHANCE=.62; and

INTERNAL=.71. These reliability levels are generally consistent with the literature.

HEALTH VALUE (HV). Subjects responded to a list of ten values (e.g., mature life, prosperous life, world peace) which included the value of health. This measure was similar to that used by Abella and Heslin (1984). Nine of the values utilized were taken from Rokeach's (1973) Value Survey and, in this study, the tenth value was health. As a value, health was considered to be 'free from physical or mental disease or pain'.

Subjects were requested to consider all the values as guiding principles in their lives, and to rank the values in order of importance, considering number 1 to be the most important and number 10 to be the least important. See Appendix C.

In this study health value ranked second highest, of the ten values, with a mean of 5.05. Similarily, health value was also ranked second, among ten values, in the study of Abella and Heslin (1984) with a mean of 3.9.

DEPENDENT VARIABLES:

PREVENTIVE HEALTH BEHAVIOR (PHB). As stated in the research hypothesis, the dependent variable is a measure of Preventive Health Behavior. The scale consists of thirty items assessing health-related behaviors (e.g., exercising, relaxing, smoking, etc.), these are consistent with the measure of preventive health behavior developed by Harris and Guten (1979). The response scale, in this present study, was a six point Likert-type scale from 1 to 6 (always to never).

The research conducted by Harris and Guten (1979) using the PHB items suggests that five dimensions existed among these thirty items. Using this as a guide in the present study, a rotated maximum likelihood factor analysis was conducted. The factor analysis appears in the table below.

TABLE 2: FACTOR ANALYSIS OF THE PREVENTIVE HEALTH BEHAVIOR SCALE - FINAL STATISTICS.

VARIABLE NAME	COMMUNALITY	FACTOR	EIGENVALUE	% OF VAR
BDENT	.23	1	4.84	16.1
BTHINGS	.12	2	1.55	5.2
BSMOKE	.03	3	1.37	4.6
BEXER	.63	4	1.04	3.5
BWEIGHT	.56	5	1.09	3.6
BLIVE	.12			
BDESTRY	.19			
BRELAX	.72			
BSLEEP	.68			
BFLOSS	.16			
BPOLLUT	.44			
BDRINK	.08			
BIGNORE	.09			
BFOOD	.46			
BTIME	.27			
BAVOID	.08			
BFIX	.54			
BCHECK	.65			
BCRIME	.48			
BMODER	.31			
BCHILL	.28			
BREGUL	.51			
BAID	.40			
BPHONE	.41			
BEAT	.49			
BHEALTH	.22			
BWEAR	.19			
BVITAM	.18			
BMED	.15			
BWORK	.22			

TABLE 2: (continued) ROTATED FACTOR MATRIX.

VARIABLE NAME	FACTOR ONE (BEHAVIOR)	FACTOR TWO (PHYSICAL)	FACTOR THREE (REGULAR)	FACTOR FOUR (RELAX)	FACTOR FIVE (STRESS)
BCRIME	.68				
BPOLLUT	.63				
BMODER	.47				
BCHILL	.46				
BMED	.36				
BDESTRY	.36				
BLIVE	.31				
BFLOSS	less then .30				
BDRINK	less then .30				
BEXER		.78			
BWEIGHT		.73			
BEAT		.55	.31		
BFOOD	.43	.51			
BTHINGS		.45			
BSMOKE		less then .30			
BREGUL			.64		
BPHONE			.62		
BAID			.57		
BDENT			.43		
BHEALTH			.35		
BWEAR			.34		
BAVOID			less then .30		
BVITAM			less then .30		
BRELAX				.82	
BSLEEP				.80	
BWORK				.35	
BCHECK					.75
BFIX					.64
BIGNORE				less then .30	

A general examination of the factor matrix indicated that five factors or sub-scales existed. These factors were conceptually consistent and, for the most part, contained items greater than .30.

Each of the following five factors or sub-scales of PHB were labelled and tested for the level of reliability using Cronbach's coefficient Alpha. The labels for each scale were chosen with an attempt to be representative of the scale items. Although each factor could have as easily been labelled numberically, name labels were more appropriate for reference purposes.

The first factor was named BEHAVIOR, which consisted of eight items reflecting some form of avoidance, caution and/or moderation. These items generally indicate a protective behavior that would not be representative of a medically defined model of preventive health behavior. The reliability Alpha calculated for this scale was .71. All items in the preventive health measure were preceded by the following statement:

IN ORDER TO PROTECT MY HEALTH I.....

The items in the BEHAVIOR scale include:

-Avoid parts of the city with a lot of crime.
-Avoid parts of the city with a lot of pollution.
-Do things in moderation.
-Avoid getting chilled.
-Avoid over the counter medicines.
-Destroy old or unused medicines.
-Pray or live by the principles or religion.
-Use dental floss.

The second factor, called PHYSICAL consists of seven items clearly reflecting forms of protective health behavior that are centered around notions of physical and mental health. The reliability Alpha for this sub-scale was strong at .72. The items in this scale include:

-Get enough exercise.
-Watch my weight.
-Eat sensibly.
-Spend free time out of doors.
-Limit foods like sugar, coffee, fats, etc.
-Don't let things get me down.
-Don't smoke.

The third factor was named REGULAR, consisting of eight items which reflect a behavior of consulting with others about health care (e.g., doctors, dentists, friends). As well, items including a list of emergency phone numbers and access to a first aid kit reflect a need for external contact with health measures. The reliability Alpha calculated for this scale was .59. Although this Alpha is considered very low and should be avoided, it was decided that because of the conceptual consistency of the items that it should be included. The items for this scale include:

-Keep emergency phone numbers near the phone.
-Have a first aid kit in the home.
-See a doctor for a regular checkup.
-See a dentist for a regular checkup.
-Wear a seat belt when in a car.
-Discuss health with friends, neighbours.
-Avoid contact with doctors when feeling okay.
-Take vitamins.

The fourth factor, named RELAX consists of three items clearly reflecting a behavior of relaxation. The reliability Alpha was strong at .70. The items in this scale include:

-Get enough relaxation.
-Get enough sleep.
-Avoid overworking.

The fifth factor called STRESS, consists of three items which reflect a behavior of caution and maintenance. The reliability Alpha was less than moderate at .57, yet again it was decided to include this sub-scale because of the clear evidence that a factor existed and that strength to which the items were displayed in the rotated factor matrix. The items in this scale include:

-Check the condition of electrical appliances, the car, etc.
-Fix broken things around the home right away.
-Ignore health advice from lay friends, neighbour, relatives.

This research will utilize the above five factors or sub-scales BEHAVIOR, REGULAR, PHYSICAL, RELAX and STRESS rather than the 30 item scale. Conceptually this makes sense .

DATA ANALYSIS. The collected data were coded and entered into a SPSS/PC+ system file. Statistical analysis were carried out using the SPSS/PC+ data processing routine. As already discussed, three general scales were constructed from this data, forming the major variables for this research: MHLC (Multidimensional Health Locus of Control), HV (Health Value), and PHB (Preventive Health Behavior). With respect to MHLC, it has been noted that three dimensions or sub-scales exist within this measure. Two of the three sub-scales (INTERNAL and CHANCE) are composed of

six items. While the third sub-scale (POWER) is composed of five items. Scale scores were obtained by adding the individual item scores, and have a potential range of 6 to 36 for INTERNAL and CHANCE, and a potential range of 5 to 30 for POWER. Scale scores were re-coded so that high scores would be indicative of internality, or rather those students who practice behaviors that are representative of the items on the INTERNAL scale would be high. Whereas those students who practice behaviors representative of POWER and CHANCE would score low on internality.

As well, scores on the ranking of the health value measure have been re-coded so that high scores will represent more desirable health (e.g., a score of 10 represents a high value of health and a score of 1 indicates a low value of health), with scores ranging from 1 to 10. Of the ten values measured, health was the only value utilized in this research.

The scale(s) constructed as the dependent variable(s), to measure Preventive Health Behavior, were RELAX, PHYSICAL, REGULAR, BEHAVIOR and STRESS. Three items were summed (i.e., relaxation; sleep; and overworking) to compose the RELAX scale, with potential scores ranging from 3 to 18. The PHYSICAL scale was composed of seven items (i.e., exercise; weight; eat; free time; foods; get me down; smoke) with scores ranging from 7 to 42. Eight items composed the REGULAR scale (i.e., phone numbers; first aid; doctor;

dentist; seat belt; discuss health; avoid doctors; vitamins) with potential scores ranging from 8 to 48. The BEHAVIOR scale similarly is composed of eight items (i.e., crime; pollution; moderation; chilled; avoid medicines; destroy medicines; pray; dental floss) with potential scores ranging from 8 to 48. And finally, three items were summed to compose the STRESS scale (i.e., check; fix; and ignore) with scores ranging from 3 to 18.

The items were re-coded so that high scores would be indicative of more desirable preventive health behavior or better health behavior.

CHAPTER V

RESULTS AND DISCUSSION

DESCRIPTIVE STATISTICS:

DEMOGRAPHICS: A discussion about the demographics of the sample will give us a general indication about the characteristics of the subjects. Several demographic variables were measured in this study: gender, age, marital status, place of birth, ethnic identification, and parental: education, occupation and income level. The measures of parental education, income and occupation were combined to provide a measure of Social Economic Status of the subjects. The construction of this measured was discussed previously.

TABLE 3: SEX DISTRIBUTION OF THE SAMPLE.

	SAMPLE SIZE	PERCENT
MALE	133	36.4
FEMALE	232	63.6
TOTAL	365	100.0

In terms of gender, nearly two-thirds of the sample were female (63.6%), while 36.4% were male. This unequal gender ratio was not unanticipated and is not expected to adversely affect the results.

TABLE 4: AGE DISTRIBUTION OF THE SAMPLE.

AGE	SAMPLE SIZE	PERCENT
18	8	2.2
19	94	25.8
20	79	21.6
21	55	15.1
22-24	58	15.9
25-30	28	7.7
31-40	27	7.4
41-57	15	4.1
TOTAL	364	100.0

As expected approximately half (47.4%) of the 365[1] subjects were between the ages of 19 and 20 (25.8% and 21.6% respectively). While the youngest age of 18 composed a very small category of 2.2%. Those students between the ages of 21 and 24 composed 31.0% of the sample, while one-fifth of the sample were over the age of 25. The oldest reported age

[1] NOTE: The sample size varies throughout this discussion because of the exclusion of missing values on each variable.

was 57, with 4.1% of the subjects being between the ages of 41 and 57.

A large proportion of the sample are well past their teenage years (72.1% of the sample were 20 years or older). It might be expected that the importance of health and the number of preventive health behaviors practiced might increase with age, especially among those well beyond their teenage years.

TABLE 5: DISTRIBUTION OF THE SAMPLE BY MARITAL STATUS.

	SAMPLE SIZE	PERCENT
SINGLE - STEADY RELATIONSHIP	152	41.6
SINGLE - NO STEADY RELATIONSHIP	148	40.5
MARRIED	37	10.1
COHABITATION	13	3.6
WIDOWED, DIVORCED OR DECEASED	12	3.3
TOTAL	362	100.0

In response to the question on marital status, it was not surprising to find that 82.2% of the sample considered themselves to be single. While 41.6% of the sample considered themselves to be single and in a steady relationship. Yet one respondent indicated that she was single and was presently in a steady relationship with five men. Surprisingly this statement was made with a great deal of seriousness. The remaining students were either married (10.1%), cohabitating (3.6%), or widowed, separated or divorced (7.7%).

TABLE 6: DISTRIBUTION OF THE SAMPLE BY PLACE OF BIRTH.

	SAMPLE SIZE	PERCENT
ONTARIO BORN	292	80.0
ELSEWHERE IN CANADA	12	3.3
FOREIGN BORN	60	16.4
TOTAL	364	100.0

In response to birth place, the majority of the students (80.0%) were born in Ontario. While only 3.3% were born elsewhere in Canada, compared to 16.4% of the students who were born outside of Canada.

TABLE 7: DISTRIBUTION OF THE SAMPLE BY ETHNIC IDENTIFICATION.

	SAMPLE SIZE	PERCENT
FRENCH	28	7.7
ENGLISH	91	24.9
IRISH	17	4.7
SCOTTISH	15	4.1
GERMAN	9	2.5
ITALIAN	23	6.3
UKRAINIAN	7	1.9
DUTCH	1	0.3
POLISH	2	0.5
JEWISH	1	0.3
CHINESE	15	4.1
OTHER	53	14.5
NONE (i.e., CANADIAN)	90	24.7
MISSING DATA	13	3.3
TOTAL	365	100.0

Interestingly, 24.9% of the students personally identified their ethnic background to be English, while an equal number (24.7%) indicated that there was no ethnic

background that they personally identified with. This group, almost half of the sample (49.6%), could be considered representative of a Canadian identity while the other half could be labelled non-Canadian in their personal identification.

TABLE 8: DISTRIBUTION OF THE SAMPLE BY PARENTAL EDUCATION.

	FATHER		MOTHER	
	SIZE	PERCENT	SIZE	PERCENT
PUBLIC SCHOOL OR LESS	73	20.0	50	13.7
SOME HIGH SCHOOL	59	16.2	67	18.4
TRADE - SOME HIGH SCH	20	5.5	17	4.7
HIGH SCHOOL COMPLETED	62	17.0	89	24.4
POST SEC - NON UNIVER	41	11.2	58	15.9
SOME UNIVERSITY	25	6.8	17	4.7
OBTAINED B.A.	24	6.6	24	6.6
FIRST PROF. DEGREE	27	7.4	21	5.8
OBTAINED MASTERS	20	5.5	15	4.1
PHD OR EQUIVALENT	11	3.0	3	0.8
MISSING	3	0.8	4	1.1
TOTAL	365	100.0	365	100.0

In response to parental education levels it was somewhat surprising to find large numbers of both mothers and fathers who had only obtained a high school education or less. This was the case for 58.6% of the fathers and 61.1% of the mothers. This group includes those parents who had completed some sort of trade schooling. Although these numbers are somewhat surprising, an equally interesting number of parents have completed more than an undergraduate degree. That being a professional degree (medicine, law, etc.), a Master's degree or a Ph.D.: 16.7% of the fathers fall into this category, while 11.8% of the mothers belong

in this group as well. This would appear to suggest that, for the most part, the parents in this study have relatively little education, and a very small group, have a great deal of education.

TABLE 9: DISTRIBUTION OF THE SAMPLE BY PARENTAL OCCUPATION.

	FATHER'S		MOTHER'S	
	SIZE	PERCENT	SIZE	PERCENT
PROFESSIONAL	103	28.2	66	18.1
TEACHER	25	6.8	30	8.2
CLERICAL	4	1.1	62	17.0
SALES - SERVICE	29	7.9	28	7.7
SKILLED	72	19.7	12	3.3
SEMI OR UNSKILLED	112	30.7	29	7.9
FARM - HOUSE WIF/HUS	8	2.2	129	35.3
DECEASED	7	1.9	4	1.1
MISSING DATA	5	1.4	5	1.4
TOTAL	365	100.0	365	100.0

With respect to parental occupation, 35.0% of the fathers were professionals (which includes teachers at 6.8%). This number is surprising considering that 58.6% of these fathers had a grade 12 education or less. Not surprisingly, 30.7% of the fathers were employed in some sort of semi-skilled or unskilled labour. While 2.2% were farmers or tended to household duties (although the later was not mentioned) and 1.9% of the fathers were deceased. Surprisingly, 26.3% of the mothers were in occupations considered professional (this includes teachers at 8.2%). While mothers, as an occupation, were the largest category

by themselves. That is, 35.3% of the students responded that their mothers were just that....mothers or housewives.

TABLE 10: DISTRIBUTION OF THE SAMPLE BY COMBINED PARENTAL INCOME.

	SAMPLE SIZE	PERCENT
LESS THAN $10,000	7	1.9
10,001 - 20,000	19	5.2
20,001 - 30.000	30	8.2
30,001 - 40,000	42	11.5
40,001 - 60,000	79	21.6
60,001 - 80,000	57	15.6
80,001 -100,000	29	7.9
OVER $100,000	44	12.1
DON'T KNOW	58	15.9
TOTAL	365	100.0

With respect to parental income, it is always a difficult question and even more troublesome when requesting the data from a secondary source. Nearly 16% of the sample indicated that they did not know their parents income. Several explanations could explain this: first, a portion of this 15.9% could be due to students whose parents are no longer in the work force and subsequentially have an income which would be difficult to calculate; second, a number of students have professional parents whose income could fluctuate, making it difficult for students to be certain what income level they would belong; and third, some students are just not aware or are never involved with their parents financial business to have an informed knowledge about their income level. Thus, we are left with a

difficult situation and the inability to make any accurate analysis about income level.

Regardless, 84.7% of those responding students indicated that their parents earned more than $30,000 in the past year. While 12.1% indicated that their parents earned in excess of $100,000 during the past year.

TABLE 11: DISTRIBUTION OF THE SAMPLE BY ILLNESS PERCEPTION.

	SAMPLE SIZE	PERCENT
YES	63	17.3
NO	275	75.3
NO RESPONSE	27	7.4
TOTAL	365	100.0

75.3% of the students responded that they have had NO serious illness or injury in the last two years. Considering the potential for sporting injuries, traffic accidents and the potential for common health ailments, it is surprising that not more than 17.3% of the subjects responded positively to this question.

INDEPENDENT VARIABLES: Subjects were asked to rank the importance of the value of health relative to nine other values (e.g., prosperous life, world peace) See Appendix C. The results of the ranking appear below.

TABLE 12: DISTRIBUTION OF THE SAMPLE BY RANKING OF HEALTH VALUE.[2]

RANK ASSIGNED TO HEALTH	SAMPLE SIZE	PERCENT
1	100	27.4
2	48	13.2
3	41	11.2
4	32	8.8
5	36	9.9
6	25	6.8
7	24	6.6
8	15	4.1
9	18	4.9
10	22	6.0
MISSING	4	1.1
TOTAL	365	100.0

Over one-half (51.8%) ranked the value of health as one of the three most important. The mean ranking of health is 5.05. While twenty-two respondents (6.0%) ranked health as the least important of the ten values, and exactly one hundred respondents (27.4%) ranked health as the most important value.

Previous research has explored the difficulties with this inexact measure of health value, noting the absence of a standardized measure (Wurtele, Britcher and Saslawsky, 1985). Although the most promising research indicates that the ranking procedure remains to be the most promising,

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[2] NOTE: In Table 12, the number 1 represents the most important ranking of the value of health and the number 10 represents the least important ranking of the value of health. After this point the health value measure was recoded so that high values would be indicative of important health values. This was necessary so that all the variables would be measured and compared similarly.

difficulties were encountered in this study that have possibly affected the clarity of the findings. Instructions were clear and concise in directing the subjects to respond to the ranking of the values, yet some failed to even simply understand what 'ranking' implies. As well, many subjects displayed troublesome feelings (written and verbally) with the forced choice format which the ranking procedure required them to complete. Many subjects could not easily make a choice between the values. While some subjects indicated that all the values were equally important, some of the difficulties in this measure can be clearly attributed the subjects failing to take time to carefully read the instructions.

With respect to the MHLC scale, the range, mode, mean, standard deviation and number of cases for each of the three sub-scales appear below.

TABLE 13: DISTRIBUTION OF THE SAMPLE ON INDEPENDENT SCALES.

SCALE NAME	RANGE	MODE	MEAN	STANDARD DEVIATION
INTERNAL	7-36	25	26.64	4.36
POWER	5-30	10	13.72	4.50
CHANCE	6-36	16	17.44	4.73

The intent of this table is to give some indication of the amount to which the three dimensions of MHLC have an actual range of scores that are comparable: INTERNAL ranges from 7 to 36, with a score of 7 being a low internal and a score of 36 being a high internal; (note: the external dimensions were recoded so that high scores would be indicative of internality) therefore, POWER ranges 5 to 30, with a score of 5 being a low internal and a score of 30 being a high internal; CHANCE ranges from 6 to 36, with a score of 6 being a low internal and a score of 36 being a high internal. As well, the mean values for each sub-scale are as they appear in the table. The mean values are consistent with other current research using the same MHLC scale (Wurtele, Britcher and Saslwasky, 1985:274). The number of cases for each variable is as follows: INTERNAL n=359; POWER n=360; and CHANCE n=361. The individual items of the three dimensions appear in Appendix H.

DEPENDENT VARIABLES: The dependent variables, PHYSICAL, REGULAR, RELAX, STRESS, BEHAVIOR, are interval level variables, that provide a measure of PHB. The range, mode, mean, standard deviation, and number of cases appear in the table below.

TABLE 14: DISTRIBUTION OF THE SAMPLE ON DEPENDENT SCALES.

SCALE NAME	RANGE	MODE	MEAN	STANDARD DEVIATION
PHYSICAL	11-42	27	28.29	5.55
REGULAR	12-48	28	32.58	6.57
RELAX	4-18	11	11.19	2.93
STRESS	3-18	10	10.06	2.92
BEHAVIOR	14-54	31	29.14	6.91

The range of scores for PHYSICAL, REGULAR and BEHAVIOR are similar. While the ranges for the RELAX AND STRESS scales are similar, they are very different from the ranges of the other three scales. The difference in ranges is due to the number of items that compose each scale. The differences in the ranges do not reflect any statistical weakness in the scales. Reliability levels were discussed earlier in Chapter VI. The number of cases for each scale is as follows: PHYSICAL n=361; REGULAR n=363; RELAX n=363; STRESS n=362; BEHAVIOR n=355.

BIVARIATE ANALYSES: CORRELATIONS AMONG DEMOGRAPHIC, INDEPENDENT AND DEPENDENT VARIABLES.

Pearson correlations have been calculated among the variables of interest and appear in Appendix E. The focus of the following discussion will centre on the relationship between each dependent variable and the various independent variables. First, however, a discussion of the correlations between the dependent PHB variables themselves, and similarly between the independent MHLC variables.

The correlations between the five dependent variables, PHYSICAL, RELAX, REGULAR, BEHAVIOR, and STRESS are all significant except one (i.e, STRESS and RELAX). Yet these correlations are weak to moderate in strength, clearly re-confirming that five separate dimensions of preventive health behavior (PHB) are being measured. The strongest of these correlations is between REGULAR and BEHAVIOR (.47** [3]), which may be indicating that one or more of the items summing these variables may be measuring similar aspects of PHB.

With respect to correlations between the MHLC measures, the following correlations were noted: CHANCE-INTERNAL-.19**; INTERNAL-POWER -.17**; and CHANCE-POWER .37**. These correlations, although significant, are indicating weak to

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[3] SIGNIFICANCE LEVELS.
* p < .01
** p < .001

moderate relationships. Like the dependent variables, these correlations are weak to moderate in strength, reconfirming the multidimensionality of the locus of control measure in this study.

ASSOCIATIONS MEASURED BETWEEN MHLC AND PHB BY PEARSONS R.

The following discussion will focus on each of the dependent variables and the strength of the relationship each has with the independent variables.

First, of the three dimensions of MHLC, only INTERNAL has a significant relationship with PHYSICAL. A r of .26** provides a moderate correlation for this relationship. This suggests that those persons who are most likely to practice those behaviors that compose the PHYSICAL scale (exercise, watch weight, eat sensibly, etc.) are likely to have an internal locus of control. The only other independent variable to have a significant relationship with the dependent variable PHYSICAL was SEX, with a r of -.20**. This is a very interesting inverse relationship, indicating that females are not as likely to practice these preventive health behavior items as are males.[4] Recalling that the response to these items were the subjects own perceptions of their behavior, it may be that females only perceive that

[4] A similar relationship will be examined later during a discussion of findings on the crosstabulations.

they DO NOT: exercise enough; watch their weight as well as they should; or limit foods like sugar, coffee, fats, etc.

Of the other independent variables, none were significant with the dependent variable PHYSICAL (See Appendix E).

The second dependent variable RELAX (i.e., get enough sleep, relaxation, and avoid over working) had a significant correlation with the same two independent variables (INTERNAL and SEX) as did the previous dependent variable, PHYSICAL. Although a Pearson r of .13* was a weak observation for the relationship between RELAX and INTERNAL, it indicates that persons who tend to be internally controlled are likely to practice the preventive behaviors that RELAX dimension measured. In addition, an inverse relationship was measured between RELAX and SEX. A significant correlation of -.23** was observed, which explains only 5.29% of the shared variance. This is an interesting, and somewhat unexpected finding, as it indicates that the females in this study are less likely to get enough sleep or relaxation as compared to their counterparts. The other independent variables did not produce significant correlations with the dependent variable RELAX.

The third dependent variable, REGULAR measures preventive behavior such as doctor and dentist checkups. This was the first of the dependent variables to have a

significant correlation with the health value measure. It was a positive relationship with a r of .15*. This would suggest that only when the value of health is held with high importance are subjects likely to practice such behaviors that the REGULAR variable measures.

Again, as with the other two dependent measures of PHB, SEX is significantly correlated with the dependent variable REGULAR. A Pearson r of .17** was observed, a positive relationship which was not unexpected. This relationship would indicated that females are more likely to practice those items measured by the REGULAR scale than are males. This was the first positive association that the independent variable SEX has had with a dependent variable; the first two dependent variables in this discussion (RELAX and PHYSICAL) had a negative relationship with the dependent variables. This finding was not unexpected, as females do tend to have more routine or 'regular' contact with health care professionals, and in general are more aware of their health care needs then are males. One of the items that REGULAR measures suggests that persons scoring high on this measure, 'discuss health with friends, family and neighbours'. In general, this would seem to be true for females.

An interesting Pearson correlation between REGULAR and INJURY of .13* suggests that practicing items from on the REGULAR measure is significantly and moderately associated

with a relatively low or nil rate of illness or injury. It was indicated earlier that over 80% of the subjects had not had a serious illness or injury within the last two years. All other independent variables failed to produce significant correlations with the dependent variable REGULAR.

The fourth dependent variable, BEHAVIOR, proved to demonstrate some interesting and unique findings; although not unexpected. First, this is the only PHB measure, of the five, that did not have a significant correlation with SEX. A surprising correlation was found between BEHAVIOR and MARITAL with an observed r of .14*. It is surprising to find that those subjects who were single were more likely to practice those items found in the measure of BEHAVIOR than persons who were not single. Observing the items within the measure of BEHAVIOR, one would find items of avoidance (crime, pollution, over the counter medicines) and an item indicating moderation. These are surprising items to be found to associated with being single. Married person might be more likely to practice such items of caution.

Again, for surprising findings, the measure of BEHAVIOR is the only dependent variable that had a significant relationship with the measure of social class (SES). An observed r of -.18** was found between BEHAVIOR and SES. This negative association would suggest that persons of lower social status background are more likely to practice

the items found in this measure of preventive health behavior. This does make sense if we consider that persons of lower SES tend to reside in areas that may have higher crime rates, and higher levels of pollution. Although some of the items within the measure of BEHAVIOR are troublesome. For example, to consider that persons of lower SES would avoid getting chilled any more than persons of higher SES does not make sense. The other independent variables did not significantly correlate with the dependent variable BEHAVIOR.

The fifth and final dependent measure of PHB, STRESS was observed to have two expected correlations. A Pearson correlation of -.20** was measured between the dependent variable STRESS and the independent variable SEX. This negative relationship would suggest that females are less likely then males to practice those items measured by STRESS. The items that compose the STRESS measure are indicative of traditionally male practiced behaviors (e.g., checking the car and electrical appliances; and fixing broken things).

As well, a correlation of .28** was measured between STRESS and AGE. This is a moderate correlation, one which would suggest that the older the person the more likely they are to practice preventive behaviors as measured by STRESS. This was an expected finding.

BIVARIATE ANALYSES: Associations Measured by Crosstabulations.

MHLC, PHB and HEALTH VALUE:

Crosstabulations were calculated on all measures of PHB and MHLC with all relevant independent measures. Following are selected contingency tables which indicate significant associations between the variables of analyses, as well, a discussion of the results of each table.

Based on the literature and the research hypothesis, the relationship between MHLC and PHB was tested using crosstabulations. The INTERNAL dimension of MHLC was the only measure of locus of control found to have a significant relationship with only two of the five dependent measures of PHB. First, INTERNAL was found to have a significant association with the dependent measure RELAX. Kendall's Tau-C was observed at .12, $p < .01$. This relationship is illustrated in the table below, which indicates that those persons who scored low on the internal locus of control measure do not practice those items measured by the RELAX scale. However, as expected those persons who scored high on the INTERNAL measure also scored high on the RELAX scale. In other words, this is indicating that there is an association between persons of high internality and regularly practicing those items on the RELAX scale.

TABLE 15: INTERNAL HEALTH LOCUS OF CONTROL BY PHB - RELAX.

INTERNAL >	LOW			HIGH	ROW TOTAL
RELAX LOW 1	27 32.5	24 27.3	28 31.5	22 22.4	101 28.2
2	26 31.3	23 26.1	23 25.8	18 18.4	90 25.1
3	22 26.5	22 25.0	17 19.1	32 32.7	93 26.0
HI 4	8 9.6	19 21.6	21 23.6	26 26.5	74 20.7
COLUMN TOTAL	83 23.2	88 24.6	89 24.9	98 27.4	358 100.0

The second dependent variable that was found to have an association with the INTERNAL measure was PHYSICAL. Kendall's Tau-C was observed at .17, $p < .01$. The table appearing below, illustrating the relationship between INTERNAL and PHYSICAL, clearly suggests that there is an association between persons who scored high on the PHYSICAL measure and those persons who measured high on the INTERNAL measure.

TABLE 16: INTERNAL HEALTH LOCUS OF CONTROL BY PHB-PHYSICAL.

INTERNAL >	LOW		HIGH		ROW
PHYSICAL LOW 1	29 35.4	25 28.4	18 20.2	18 18.4	90 25.2
2	28 34.1	22 25.0	25 28.1	24 24.5	99 27.7
3	15 18.3	25 28.4	27 30.3	26 26.5	93 26.1
HI 4	10 12.2	16 18.2	19 21.3	30 30.6	75 21.0
COLUMN TOTAL	82 23.0	88 24.6	89 24.9	98 27.5	357 100.0

Persons who scored high on the items of exercising, weight watching, sensible eating, not smoking, etc. have a relationship with high internality. This result would be expected from what the literature indicates, as well, such behavior would expected from a younger student population.

Further the literature and the research hypothesis indicates that MHLC would predict PHB only under conditions of high HEALTH VALUE. Based on the above two significant associations between MHLC (INTERNAL) and PHB (RELAX and PHYSICAL), these associations were tested under conditions of high HEALTH VALUE.

The significant relationships which initially existed between MHLC and PHB failed to continue to be significant under conditions of high health value. The tables for both of these non-significant findings appear in Appendix F. This was unexpected in light of the literature and initial results. Such findings may be due to specific and unique characteristics of the sample (i.e., a skewed age distribution, a sample of high achievers from middle and upper social class backgrounds). As well, methodologically, problems may have existed to a certain extent as the HEALTH VALUE measure was answered inappropriately in some cases. And finally, a great many of the sample may still be heavily influenced by their parents (for religious or financial reasons) which may not encourage the students to be responsible in their preventive health practices.

The initial testing of the independent and dependent measures produced a number of interesting findings. Specifically, gender (or what has been labelled SEX) and the area of academic concentration (AREA) produced consistent findings throughout the analysis. As well, the variable summed to measure social economic status (SES) produced interesting relationships with two of the dependent variables The findings, tables and discussion are presented in the following section.

GENDER AND ASSOCIATIONS WITH PHB.

A significant relationship was measured between SEX and RELAX. Kendall's Tau C had a value of .26, $p < .01$. The table, appearing below, indicates that females scored very low on the RELAX measure while males scored relatively high. This is one of the clearest distinctions between gender in this study. As can be seen in the table below, 32.3% of the males scored in the highest category of RELAX while only 14.3% of the females scored in the same category.

TABLE 17: GENDER BY PHB - RELAX

SEX >	MALE	FEMALE	ROW
RELAX LOW 1	25 18.8	76 33.0	101 27.8
2	27 20.3	66 28.7	93 25.6
3	38 28.6	55 23.9	93 25.6
HI 4	43 32.3	33 14.3	76 20.9
COLUMN TOTAL	133 36.6	230 63.4	363 100.0

Observing the lowest category of RELAX (LOW 1), it can be seen that the exact opposite relationship exists

(i.e., males = 18.8% and females = 33.0%) This clearly suggests that males in this study practice items of preventive health measured by RELAX more often then do females. This would suggest that males perceive themselves to get enough sleep, relaxation, and do avoid overworking. While this is not true for females. The distinct difference between gender on this measure brings us to a number of questions. Do females really over work and never get enough sleep; and do males really not overwork ? Or is this relationship based on the perceived level of satisfaction for sleep and relaxation. In other words, do females desire more of the items on the RELAX measure then do males? The following tables will add to this discussion.

The relationship between SEX and PHYSICAL produced a Kendall's Tau C of -.18, $p < .01$. The table below indicates that 32.3% of the males scored in the highest category compared to only 14.5% of the females.

TABLE 18: GENDER BY PHB - PHYSICAL.

SEX >		MALE	FEMALE	ROW
RELAX LOW	1	28 21.1	63 27.6	91 25.2
	2	30 22.6	69 30.3	99 27.4
	3	32 24.1	63 27.6	95 26.3
HI	4	43 32.3	33 14.5	76 21.1
COLUMN TOTAL		133 36.8	228 63.2	361 100.0

This finding closely resembles the result from the previous crosstabulation (i.e., SEX by RELAX). It is interesting to consider that the males in this study are more likely to practice those items measured by PHYSICAL than are females. Considering that these items are measuring weight watching, exercising, eating sensibly, limiting sugars, fats, coffee, etc., it is surprising to find that males scored higher than females. Although this finding may be explained by the fact that it is the perception of the respondent (i.e., females may only perceive themselves not to practice the items as measured by PHYSICAL with the consistency that they would wish). As

well, males may only perceive themselves to practice these items with a great deal of consistency.

Further, the relationship between SEX and REGULAR was tested, producing a Kendall's Tau C of .15, $p < .01$. These findings are opposite to that of the previous two crosstabulations.

TABLE 19: GENDER BY PHB - REGULAR.

SEX >	MALE	FEMALE	ROW
REGULAR LOW 1	32 24.1	44 19.1	76 20.9
2	44 33.1	53 23.0	97 26.7
3	40 30.1	80 34.8	120 33.1
HI 4	17 12.8	53 23.0	70 19.3
COLUMN TOTAL	133 36.6	230 63.4	363 100.0

In this case, females scored higher than males in the category of high preventive health behavior (females = 23.0% and males = 12.8%). The items on this measure of PHB include regular doctor and dentist visits, emergency numbers by the phone, discussing health with friends and neighbours,

wearing seat belts, etc. The table indicates that females practice these items more then do males. This finding might be expected based on traditional notions of female health care; females having annual visits with health professionals.

The fourth dependent variable, as well, produced significant results with the gender category. The relationship between the dependent variable BEHAVIOR and SEX produced a Kendall's Tau C of .16, $p < .01$.

TABLE 20: GENDER BY PHB - BEHAVIOR.

SEX >	MALE	FEMALE	ROW
BEHAVIOR LOW 1	43 32.8	50 22.3	93 26.2
2	40 30.5	53 23.7	93 26.2
3	24 18.3	69 30.8	93 26.2
HI 4	24 18.3	52 23.2	76 21.4
COLUMN TOTAL	131 36.9	224 63.1	355 100.0

This is the second of only two dependent variables that females scored higher on then males (i.e., in the highest PHB category). This alone is an interesting finding, in that it suggests for this study that males

scoring higher then females, also practice preventive health behaviors more then females.

The association between BEHAVIOR and SEX indicates that in the highest category, females compose 23.2% whereas males composed only 18.3%. In this case, females scored higher on items of avoidance (crime, pollution, over the counter medicines) and items of moderation. In the lowest two categories of this measure, males composed 63.3% whereas females composed only 46.0% . This would suggest that males do not practice these items of avoidance and moderation to the same degree that females do.

The fifth and final measure of PHB (STRESS) was crosstabulated with SEX. Kendall's Tau C was observed at .19, $p < .01$.

TABLE 21: GENDER BY PHB - STRESS.

SEX >	MALE	FEMALE	ROW
STRESS LOW 1	18 13.6	52 22.6	70 19.3
2	30 22.7	58 25.2	88 24.3
3	43 32.6	87 37.8	130 35.9
HI 4	41 31.1	33 14.3	74 20.4
COLUMN TOTAL	132 36.5	230 63.5	362 100.0

The difference between males and females on this measure was clear. In the highest category of PHB, males composed 31.1% while females composed only 14.3%. Such differences can be accounted for in an examination of the items that sum the STRESS measure. Two of the items refer to maintaining electrical appliances and automobiles; such items traditionally have been considered the responsibility of males. Or rather, males have been more inclined to attend to the maintenance of such items.

ACADEMIC AREA OF CONCENTRATION AND ASSOCIATIONS WITH PHB.

Of the five dependent measures of PHB, four were found to have a significant relationship with the students academic area of concentration (AREA). The following section considers the relationship between each of the four dependent measures of PHB and AREA. As well, these relationships were further examined by controlling for gender. It is this analysis which demonstrates some interesting findings.

Crosstabulations were calculated between the independent variable AREA and the dependent PHB variable PHYSICAL. This relationship was observed to have a weak significance with Kendall's Tau C at -.09, $p < .05$.

TABLE 22: ACADEMIC AREA OF CONCENTRATION BY PHB - PHYSICAL.

AREA >	SCIENCE	NON-SCI	ROW TOTAL
PHYSICAL LOW 1	23 21.9	68 26.7	91 25.3
2	24 22.9	74 29.0	98 27.2
3	31 29.5	64 25.1	95 26.4
HI 4	27 25.7	49 19.2	76 21.1
COLUMN TOTAL	105 29.2	255 70.8	360 100.0

Observing the above table, a somewhat greater percentage of science students practiced the preventive behavior items then did non-science students. This was not an unexpected finding. As well, this would be consistent behavior for science students; science students are considered to be somewhat more knowledgeable about nutrition, disease, and health than non-science students.

Considering the effects of gender on previous associations, it was decided to control for gender in the above relationship. The following table was produced.

TABLE 23: ACADEMIC AREA OF CONCENTRATION BY PHB (PHYSICAL) BY SEX.

	MALES			FEMALES		
AREA >	SCIENCE	NON-SCI	ROW TOTAL	SCIENCE	NON-SCI	ROW TOTAL
PHYSICAL LOW 1	10 26.3	18 19.1	28 21.2	13 19.4	50 31.1	63 27.6
2	5 13.2	24 25.5	29 22.0	19 28.4	50 31.1	69 30.3
3	11 28.9	21 22.3	32 24.2	20 29.9	43 26.7	63 27.6
HI 4	12 31.6	31 33.0	43 32.6	15 22.4	18 11.2	33 14.5
COLUMN TOTAL	38 28.8	94 71.2	132 100.0	67 29.4	161 70.6	228 100.0

As indicated by the above table, the previously significant relationship failed to continue for males, while the relationship for females remained strong. The observe measure of Tau C for males was .01, $p > .45$ and for the females -.16, $p < .01$. While from the table it is evident that more female science students (22.4%) practice more of the preventive health behaviors listed in the PHYSICAL scale then did female non-science students. This finding was not unanticipated.

The second dependent PHB variable RELAX had a significant relationship with AREA. Kendall's Tau C was

measured at .15, $p < .01$ This was the only measure of PHB where non-science students (23.0%) out performed science students (15.2%) in the highest category of PHB, as the table below illustrates.

TABLE 24: ACADEMIC AREA OF CONCENTRATION BY PHB - RELAX.

AREA >		SCIENCE	NON-SCI	ROW TOTAL
RELAX LOW	1	39 37.1	62 24.1	101 27.9
	2	28 26.7	65 25.3	93 25.7
	3	22 21.0	71 27.6	93 25.7
HI	4	16 15.2	59 23.0	75 20.7
COLUMN TOTAL		105 29.0	257 71.0	362 100.0

Considering the items on the measure of RELAX it is reasonable to assume science students are not as likely (or unable) to practice such behavior as are non-science students. It is common for science students to indicate that they have not had enough sleep or relaxation, these being the key items on the RELAX scale. In fact, from the table it can be seen that almost 40% of the science students score in the lowest category of RELAX.

The table below suggests that this finding continued to remain true even when controlling for gender. Kendall's Tau C was .15, $p < .04$ for the males and .15, $p < .01$ for the females. It was not surprising to find that both male and female non-science students both continued to practice more of the RELAX items then did the science students.

TABLE 25: ACADEMIC AREA OF CONCENTRATION BY PHB (RELAX) BY SEX.

	MALES			FEMALES		
AREA >	SCIENCE	NON-SCI	ROW TOTAL	SCIENCE	NON-SCI	ROW
RELAX	10	15	25	29	47	76
LOW 1	26.3	16.0	18.9	43.3	28.8	33.0
	9	18	27	19	47	66
2	23.7	19.1	20.5	28.4	28.8	28.7
	10	28	38	12	43	55
3	26.3	29.8	28.8	17.9	26.4	23.9
	9	33	42	7	26	33
HI 4	23.7	35.1	31.8	10.4	16.0	14.3
COLUMN	38	94	132	67	163	230
TOTAL	28.8	71.2	100.0	29.1	70.9	100.0

In the table above it is interesting to note that in the lowest category of RELAX more female science students (43.3%) then males science students (26.3%) practiced the least of the RELAX items. To consider that more female then male science students perceive themselves not to get enough sleep or relaxation was an unexpected finding. This may

suggest that females find that they have to work harder (meaning less sleep or relaxation) then males to succeed in the sciences.

Considering the relationship between the third dependent variable BEHAVIOR and AREA, it was found to have a significant relationship with an observed Tau C of -.10, $p < .03$.

TABLE 26: ACADEMIC AREA OF CONCENTRATION BY PHB - BEHAVIOR.

AREA >	SCIENCE	NON-SCI	ROW TOTAL
BEHAVIOR LOW 1	19 18.3	74 29.6	93 26.3
2	30 28.8	63 25.2	93 26.3
3	29 27.9	64 25.6	93 26.3
HI 4	26 25.0	49 19.6	75 21.2
COLUMN TOTAL	104 29.4	250 70.6	354 100.0

As the table above indicates, a greater number of science students (25.0%) performed the BEHAVIOR items then did non-science students (19.6%). While the more interesting finding suggests that it is the lowest category which illustrates the greatest effect. Almost 30% of the non-science students scored in the lowest category of this

preventive health behavior, compared to a little more than 18% of the science students.

This relationship was further examined controlling for gender. The results of this analysis appear in the table below.

TABLE 27: ACADEMIC AREA OF CONCENTRATION BY PHB (BEHAVIOR) BY SEX.

	MALES			FEMALES		
AREA >	SCIENCE	NON-SCI	ROW TOTAL	SCIENCE	NON-SCI	ROW TOTAL
BEHAVIOR LOW 1	16 42.1	49 53.3	65 50.0	13 19.7	64 40.3	77 34.2
2	14 36.8	22 23.9	36 27.7	25 37.9	49 30.8	74 32.9
3	5 13.2	13 14.1	18 13.8	19 28.8	32 20.1	51 22.7
HI 4	3 7.9	8 8.7	11 8.5	9 13.6	14 8.8	23 10.2
COLUMN TOTAL	38 29.2	92 70.8	130 100.0	66 29.3	159 70.7	225 100.0

Kendall's Tau C was -.06, $p > .23$ for male respondents, and for female students -.19, $p < .01$. The relationship failed to continue for males, yet the relationship gained strength for females. In other words, there is no relationship for male students between academic area of

concentration and the preventive measure of BEHAVIOR. But the area of academic concentration continued to be influential for female students. Specifically, female science students were somewhat more active in their preventive health behavior then were non-science students, as measured by the BEHAVIOR scale.

The fourth and final dependent variable, STRESS, which proved to have a significant relationship with the independent measure of AREA, was observed with a Tau C of -.17, $p < .001$. Interesting results appear in the table below which suggest clear differences between science and non-science students.

TABLE 28: ACADEMIC AREA OF CONCENTRATION BY PHB - STRESS.

AREA >	SCIENCE	NON-SCI	ROW TOTAL
STRESS LOW 1	13 12.4	56 21.9	69 19.1
2	22 21.0	66 25.8	88 24.4
3	38 36.2	92 35.9	130 36.0
HI 4	32 30.5	42 16.4	74 20.5
COLUMN TOTAL	105 29.1	256 70.9	361 100.0

Of those students who scored in the highest category of the preventive measure STRESS, 30.5% of those science students compared to only 16.4% who were non-science students. Again, this clearly suggests that science students are much more attentive to their preventive health care behaviors then are non-science students. It is interesting to note the level of non-science students who also appear active in practicing preventive health behaviors. It may be the utilization of a measure of preventive health that includes many items that are not solely based on the 'medical model' which enables both science and non-science students to demonstrate their preventive health strengths.

Like the other measures of PHB, the relationship between AREA and STRESS was also controlled for by gender. The results of this analysis appear in the table below.

TABLE 29: ACADEMIC AREA OF CONCENTRATION BY PHB (STRESS) BY SEX.

	MALES			FEMALES		
AREA >	SCIENCE	NON-SCI	ROW TOTAL	SCIENCE	NON-SCI	ROW TOTAL
STRESS LOW 1	3 7.9	14 15.1	17 13.0	10 14.9	42 25.8	52 22.6
2	8 21.1	22 23.7	30 22.9	14 20.9	44 27.0	58 25.2
3	13 34.2	30 32.3	43 32.8	25 37.3	62 38.0	87 37.8
HI 4	14 36.8	27 29.0	41 31.3	18 26.9	15 9.2	33 14.3
COLUMN TOTAL	38 29.0	93 71.0	131 100.0	67 29.1	163 70.9	230 100.0

The relationship between AREA and STRESS was not maintained controlling for males; a Tau C of -.11, $p = .11$. Yet the relationship controlling for females continued or even gained strength, as a Tau C of -.21, $p < .001$. An interesting number of female science students (26.9%) scored in the high category, compared to only 9.2% of the non-science students. These findings are somewhat surprising considering the items that comprise the STRESS measure (i.e., checking the condition of electrical appliances, the car; as well, fixing broken things around the home right away). These are maintenance items which traditionally have been male dominated.

SOCIAL ECONOMIC STATUS (SES) AND ASSOCIATIONS WITH PHB.

Of the five dependent measures of PHB, only two proved to have a significant relationship with the measure of SES. A discussion of the construction of the SES measure appeared earlier in the methodology section. It is important to recall that students tend to have no social or economic status because they are students. They are, in fact, in the process of developing their own social and economic status (e.g., by obtaining the necessary education to achieve such status). Thus, it becomes necessary to examine the social and economic information of their parents to develop an approximation of the students SES background.

The PHYSICAL measure of PHB and SES produced a significant relationship with a Tau C of .08, p = 04. As the table below suggests, the results are moderate in strength. Yet the directional strength which exists suggests that high SES is significantly related to high PHB behavior on the PHYSICAL measure. This holds true for low SES and low behavior on the PHYSICAL scale. These findings were not unexpected.

TABLE 30: SOCIAL ECONOMIC STATUS BY PHB - PHYSICAL.

SES >	LOW			HIGH	ROW TOTAL
PHYSICAL LOW 1	29 30.2	26 29.2	17 18.5	19 22.6	92 25.2
2	23 24.0	24 27.0	28 30.4	24 28.6	99 27.4
3	28 29.2	22 24.7	29 31.5	16 19.0	95 26.3
HI 4	16 16.7	17 19.1	18 19.6	25 29.8	76 21.1
COLUMN TOTAL	96 26.6	89 24.7	92 25.5	84 23.3	361 100.0

The second measure of PHB that had a significant result with the measure of SES was BEHAVIOR. Recall that this dependent measure is partly composed of items of avoidance and moderation.

Kendall's Tau C was -.19, $p < .001$. This table suggests some very interesting findings. Very few students were in the highest category of this PHB measure. This would suggest that persons who have a high degree of SES practice very few of the items measured by BEHAVIOR.

TABLE 31: SOCIAL ECONOMIC STATUS BY PHB - BEHAVIOR.

SES >	LOW			HIGH	ROW
BEHAVIOR LOW 1	25 26.6	31 35.2	40 44.4	46 54.8	142 39.9
2	31 33.0	26 29.5	33 36.7	21 25.0	111 31.2
3	25 26.6	19 21.6	13 14.4	12 14.3	69 19.4
HI 4	13 13.8	12 13.6	4 4.4	5 6.0	34 9.6
COLUMN TOTAL	94 26.4	88 24.7	90 25.3	84 23.6	356 100.0

CHAPTER VI

CONCLUSION

Very interesting and distinct findings between gender and all five of the measures of PHB have been noted. Males, in this study, were found to practice certain behaviors more than their counterparts. For example, males were more likely then females to practice behaviors of sleep, relaxation, watching weight, maintaining electrical appliances, avoiding overworking. Whereas females were more attentive to items of seeing doctors and dentists for regular checkups, discussing health with friends, avoiding crime and pollution, avoiding over the counter medicines and destroying unused medicines. These findings challenge some of the traditional beliefs that we may have had about which gender considers what important. Males, more then females, were found to exercise, watch their weight, eat sensibly, and limit foods like sugar, coffee, fats, etc. This suggests that young males are as concerned as females about very specific aspects of their health. This is an important finding considering that some of these items are very basic and important building blocks of a healthy body and mind.

Early in this research, it was believed that the students chosen area of academic concentration (AREA) would have some association with their preventive health behavior

practices. This was found to be very true, with four of the five dependent measures of PHB having a significant relationship with AREA. The findings clearly suggests that science students practice preventive measures more than non-science students. This was true on the measures of PHYSICAL, BEHAVIOR, and STRESS, whereas non-science students were more successful at practicing the items of the RELAX scale. The RELAX measure clearly suggested that science students do not get enough relaxation nor sleep, and as well do not avoid overworking. On the other hand, non-science students scored very high on these items. When gender was controlled for in these relationships, it was found that the significant associations continued in all cases for females and only in one case for males.

In general, it would appear that science students perform more preventive behaviors than non-science students. This would be consistent with general beliefs and understandings of science students. That is, science students have a greater opportunity to be informed about health and illness, and the affects of certain behaviors.

The measure of Social Economic Status (SES) produced a significant relationship with two of the dependent measures of PHB. The findings were relatively weak, although significant. Nevertheless, they suggest that, for the most part, persons with a high degree of SES also practice some

PHB items to a high degree; especially those items on the PHYSICAL scale.

The research hypothesis, based on current literature, stated that MHLC would predict PHB only under conditions of high health value. Unfortunately, the associations measured by crosstabuluations failed to produce significant results under conditions of high health value. The complexity of the measures may be partially at fault for the lack of findings in this relationship. An important explanation for the lack of results can be found when examining the highly skewed age distribution of the sample. This is thought to have had an affect on this insignificant relationship. For the most part, this sample was composed of young, healthy, socially advantaged persons who have only recently experienced the freedom and independence that comes from leaving home to attend a post secondary institution. Many of these students continue to rely on powerful others for their daily needs, regardless of their perceived degree of self possessed internality.

It is disappointing that these variables did not have a significant association since these health behaviors are so clearly associated with enhancing and controlling one's health. It appears that attempting to predict PHB using MHLC among young healthy individuals may have limited usefulness as a research approach.

This research has examined preventive health behaviors, health locus of control and health value. Current literature examining preventive health behaviors has utilized scales that measure very specific health practices (e.g., smoking), as well as general measures testing for a number of health behaviors. Neither measure appears to have been any more successful in explaining variance, yet the all inclusive measures would appear to be more consistent conceptually. Further development of specific measures continues to be encouraged from almost all current research.

In the present study a measurement of health locus of control (i.e., the Multidimensional Health Locus of Control scale or the MHLC) was examined. In the past, several types of locus of control scales have been utilized; however the most promising scale appears to be the MHLC. Current literature has suggested important implications and considerations for further research (Wallston and Wallston, 1981). Beyond encouraging the use of MHLC over the HLC scales, it has been suggested that researchers continue to develop measures of HLC that are specific to the research design. For example, specific measures exist for smoking cessation, cancer patients, and even a measure for the fear of needles. It has been suggested that sophisticated scale development is not necessary, as simple measures have proven to be as effective (Wallston and Wallston, 1981).

The literature, also, has suggested that HLC will predict PHB, only under conditions of high health value. It is this type of research that appears to be the most promising. Intuitively, the use of a measure of health value makes conceptual sense. Those persons who have a high value of health would be expected to have a greater awareness of preventive health practices. It is this argument that encourages further research into predicting health behaviors using measures of health locus of control and health value. Yet, the findings of the present study were not able to support this contention.

Five dimensions of preventive health behavior were examined as dependent variables. The five variables were named: RELAX, BEHAVIOR, PHYSICAL, REGULAR, and STRESS. (See Appendix G for the individual items that composed each dimension).

These dependent variables were examined with respect to a number of independent variables, including Multidimensional Health Locus of Control (MHLC) and a measure of health value. The MHLC scale was composed of three dimensions known as POWER, INTERNAL, and CHANCE. (See Appendix H for the individual items that composed each dimension).

Future research needs to seriously consider the following suggestions before initiating a research project.

Two of the areas that need careful consideration include 1. scale development, and 2. sample selection. These two areas would appear to have been problematic in the present study, and the literature would seem to suggest that it has been cause for concern.

First, scale construction needs to be developed specifically for the research project at hand. The items to be used in the research need careful consideration in order that they reflect behaviors that would be typical of that population. Designing specific measures would attempt to integrate all other aspects of the research design. As well, thought needs to be put into the direction of the items in the questionnaire. Negatively worded items appeared to cause respondents many difficulties in the present study. For example, when a student wanted to respond to 'I don't drink', with response choices ranging from ALWAYS to NEVER, some became very confused with double negatives. To eliminate potential confusion at the design stage is highly desirable, although in this study we would have expected a university population to easily handle such grammatic decisions.

Further, the value of health measure needs to be seriously considered for it would appear, from the literature, to be integral to part of the relationship between locus of control and preventive health behaviors. The conceptualization would appear to be sound, as various

researchers have employed such measures with success. Some literature indicates that the value of health can be measured in at least two ways, successfully obtaining similar results (Wurtele et al., 1985). This study found that the respondents inability to comprehend to directions given for the health value measure caused difficulties. As well, the items which compose the health value measure prove troublesome in that several are overlapping. As seen in Appendix C, the items HAPPINESS, SELF-RESPECT, and HEALTH would appear to be measuring a much broader concept of well being. This conceptualization of the value of health would appear to be more fruitful in this type of research. Further the measure of health value needs to be culturally sensitive. That is, the importance of health is viewed differently in many cultures.

Future research needs to take into account the specific characteristics of the chosen population. The literature indicates that the use of the MHLC scale has greater success with predicting the behavior of chronic patient populations (Wallston and Wallston, 1981:237). As mention, this study consisted of a young, healthy, relatively affluent population. These respondents have had less experience with illness, and for the most part have likely had their health care needs provide for from significant others.

This study and other literature encourages the continued development of health locus of control, health

value and the relationship to preventive health behavior. Yet, the careful design and implementation of such research needs to be well thought out.

APPENDIX A: Multidimensional Health Locus of Control Items.

If I get sick, it is my own behavior which determines how soon I get well again.

No matter what I do, if I am going to get sick, I will get sick.

Having regular contact with my physician is the best way for me to avoid illness.

Most things that affect my health happen to me by accident.

Whenever I don't feel well, I should consult a medically trained professional.

I am in control of my health.

My family has much to do with my becoming sick or staying healthy.

When I get sick I am to blame.

Luck plays a big part in determining how soon I will recover from an illness.

Health professionals control my health.

My good health is largely a matter of good fortune.

The main thing which affects my health is what I myself do.

If I take care of myself, I can avoid illness.

When I recover from an illness it's usually because other people (i.e., doctors, family, friends) have been taking good care of me.

No matter what I do, I'm likely to get sick.

If it's meant to be, I will stay healthy.

If I take the right actions, I can stay healthy.

Regarding my health, I can only do what my doctor tells me to do.

APPENDIX B: Preventive Health Behavior Items.

IN ORDER TO PROTECT MY HEALTH I:

See a dentist for a regular checkup.
Don't let things 'get me down'.
Don't smoke.
Get enough exercise.
Watch my weight.
Pray or live by the principles of religion.
Destroy old or unused medicines.
Get enough relaxation.
Get enough sleep.
Use dental floss.
Avoid parts of the city with a lot of pollution.
Don't drink.
Ignore health advice from lay friends, neighbours, and relatives.
Limit foods like sugar, coffee, fats, etc.
Spend free time out of doors.
Avoid contact with doctors when feeling okay.
Fix broken things around the home right away.
Check the condition of electrical appliances, the car, etc.
Avoid parts of the city with a lot of crime.
Do things in moderation.
Avoid getting chilled.
See a doctor for a regular checkup.
Have a first aid kit in the home.
Keep emergency phone numbers near the phone.
Eat sensibly.
Discuss health with friends, neighbours.
Wear a seat belt when in a car.
Take vitamins.
Avoid over-the-counter medicines.
Avoid overworking.

APPENDIX C: Health Value Items.

A comfortable life (a prosperous life)

A world at peace (free of war and conflict)

Equality (equal opportunity for all)

Freedom (independence, free choice)

Happiness (content)

Health (free from physical or mental disease or pain)

Interharmony (freedom from inner conflict)

Mature love (sexual and spiritual intimacy)

Self respect (self-esteem)

True friendship (close companionship)

APPENDIX D: Questionnaire.

March 19, 1990.

You are one of several hundred introductory sociology students at the University of Windsor participating in this study examining young people's attitudes and beliefs about health behavior. This questionnaire is a central part of the research necessary for completion of my M.A. thesis. It is important that you complete the questionnaire as accurately as possible. It will take approximately 15 minutes to complete. Please answer each question in the space provided.

Be assured that your answers will remain totally anonymous. Do not put your name or student identification number anywhere on this material. Your responses as expressed here will remain completely private.

Thank you for your cooperation on this study, you have made a valuable contribution to my research training.

William Kreutzweiser.

If you have any questions regarding this survey, please contact me at the Department of Sociology and Anthropology by leaving a message at 253-4232, extension 2188.

APPENDIX D: Questionnaire.
PLEASE FILL-IN, CHECK OR CIRCLE THE APPROPRIATE RESPONSE.

1. How old are you? _____(in years)

2. What is your sex? (please circle number)

   1. Male
   2. Female

3. What is your marital status? (please circle number)

   1. Single (engaged or steady boyfriend/girlfriend)
   2. Single (no steady relationship)
   3. Currently married
   4. Cohabitation (living together)
   5. Widowed, Divorced or Separated
   6. Other (please specify)_____

4. What is your place of birth? Province_____

   Country_____

5. What is your father's place of birth?

   Province_____

   Country_____

6. What is your mother's place of birth?

   Province_____

   Country_____

7. To what ethnic or cultural group(s) do you or did most of your ancestors belong. (Circle as many as apply).

1.	French	2.	English
3.	Irish	4.	Scottish
5.	German	6.	Italian
7.	Ukrainian	8.	Dutch
9	Polish	10.	Jewish
11.	Chinese		
12.	Other_____(please specify)		

APPENDIX D: Questionnaire.

8. With which <u>one</u> of the above ethno cultural groups in Question 7 do <u>you personally</u> identify? (If no one group,please indicate none).
Personal identification _____

9. How certain do you feel yourself a member of your chosen ethnic group in Question 8? (Circle a number).

1	2	3	4	5	6
Extremely Uncertain	Uncertain	Somewhat Uncertain	Somewhat Certain	Certain	Extremely Certain

10. For most your life, what was the population of the location in which you lived? (Circle number)

1. rural/farm
2. rural/nonfarm
3. urban/town area -- under 10,000
4. 10,000 - 49,999
5. 50,000 - 99,999
6. 100,000 - 499,999
7. 500,000 or more.

Guide: Population of London 275,000
Population of Toronto 2,500.000

11. How many brothers do you have?_____

12. How many sisters do you have?_____

13. In terms of the number of children in your family, are you the first born, second born, third born, etc? _____ (please state your birth order).

14. What was the highest level of formal education obtained by your parents? (Please circle)

	Father	Mother
Public school or less	01	01
Some high school	02	02
Not completed post secondary/with trade	03	03
Completed high school	04	04
Completed post secondary/non university training		05
Some university	06	06
Obtained Bachelor's Degree	07	07
Obtained First Professional Degree	08	08
Obtained Master's Degree	09	09
Obtained Ph.D. or equivalent	10	10

Other: Please specify_____

APPENDIX D: Questionnaire.

15. What is your father's usual occupation? (What has he done for most of his working life?) Please specify the occupation and say what he does on his job.

_____

_____

16. What is your mother's usual occupation? (What has she done for most of her working life?) Please specify the occupation and say what she does on her job?

_____

_____

17. What is your religion? (Please circle)

1. Protestant
2. Catholic
3. Jewish
4. Other _____ (please specify)
5. None

18. What was your religion at age 10?

1. Protestant
2. Catholic
3. Jewish
4. Other _____(please specify)
5. None

APPENDIX D: Questionnaire.

19. How often do you attend formal religious services?

1. More than once a week
2. Once a week
3. 2-3 times a month
4. Once a month
5. Several times a year
6. Once or twice a year
7. Never

20. While it may be difficult to estimate, approximately what is your parent(s) total annual income? (Circle one answer only)

1. Under 10,000 dollars
2. 10,000 - 20,000
3. 20,001 - 30,000
4. 30,001 - 40,000
5. 40,001 - 60,000
6. 60,001 - 80,000
7. 80,001 - 100,000
8. Over 100,000
9. Don't know.

21. What is your intended area of concentration at university?

1. Arts _____(please specify)
2. Social Science _____(please specify)
3. Science _____(please specify)
4. None _____
5. Other _____(please specify)

APPENDIX D: Questionnaire.

22. PLEASE ANSWER THE FOLLOWING ITEMS, TRYING TO RESPOND TO EACH ITEM INDEPENDENTLY BUT NOT SPENDING TOO MUCH TIME ON ANY ONE ITEM. EACH ITEM IS A BELIEF STATEMENT WITH WHICH YOU MAY AGREE OR DISAGREE. DO NOT BE INFLUENCED BY YOUR PREVIOUS CHOICES.

1 Strongly Agree	2 Agree	3 Slightly Agree	4 Slightly Disagree	5 Disagree	6 Strongly Disagree

If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
Having regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
Most things that affect my health happen to me by accident.	1	2	3	4	5	6
Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
I am in control of my health.	1	2	3	4	5	6
My family has much to do with my becoming sick or staying healthy.	1	2	3	4	5	6
When I get sick I am to blame.	1	2	3	4	5	6
Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
Health professionals control my health.	1	2	3	4	5	6
My good health is largely a matter of good fortune.	1	2	3	4	5	6
The main thing which affects my health is what I myself do.	1	2	3	4	5	6
If I take care of myself, I can avoid illness.	1	2	3	4	5	6

APPENDIX D: Questionnaire.

When I recover from an illness it's usually because other people (i.e., doctors, family, friends) have been taking good care of me.	1	2	3	4	5	6
No matter what I do, I'm likely to get sick.	1	2	3	4	5	6
If it's meant to be, I will stay healthy.	1	2	3	4	5	6
If I take the right actions, I can stay healthy.	1	2	3	4	5	6
Regarding my health, I can only do what my doctor tells me to do.	1	2	3	4	5	6

1	2	3	4	5	6
Always	Almost Always	Generally	Sometimes	Almost Never	Never

IN ORDER TO PROTECT MY HEALTH I:

See a dentist for a regular checkup.	1	2	3	4	5	6
Don't let things 'get me down'.	1	2	3	4	5	6
Don't smoke.	1	2	3	4	5	6
Get enough exercise.	1	2	3	4	5	6
Watch my weight.	1	2	3	4	5	6
Pray or live by the principles of religion.	1	2	3	4	5	6
Destroy old or unused medicines.	1	2	3	4	5	6
Get enough relaxation.	1	2	3	4	5	6
Get enough sleep.	1	2	3	4	5	6
Use dental floss.	1	2	3	4	5	6
Avoid parts of the city with a lot of pollution.	1	2	3	4	5	6
Don't drink.	1	2	3	4	5	6
Ignore health advice from lay friends, neighbours, and relatives.	1	2	3	4	5	6
Limit foods like sugar, coffee, fats, etc.	1	2	3	4	5	6

APPENDIX D: Questionnaire.

Spend free time out of doors.	1	2	3	4	5	6
Avoid contact with doctors when feeling okay.	1	2	3	4	5	6
Fix broken things around the home right away.	1	2	3	4	5	6
Check the condition of electrical appliances, the car, etc.	1	2	3	4	5	6
Avoid parts of the city with a lot of crime.	1	2	3	4	5	6
Do things in moderation.	1	2	3	4	5	6
Avoid getting chilled.	1	2	3	4	5	6
See a doctor for a regular checkup.	1	2	3	4	5	6
Have a first aid kit in the home.	1	2	3	4	5	6
Keep emergency phone numbers near the phone.	1	2	3	4	5	6
Eat sensibly.	1	2	3	4	5	6
Discuss health with friends, neighbours.	1	2	3	4	5	6
Wear a seat belt when in a car.	1	2	3	4	5	6
Take vitamins.	1	2	3	4	5	6
Avoid over-the-counter medicines.	1	2	3	4	5	6
Avoid overworking.	1	2	3	4	5	6

---

24. Have your had a serious illness or injury in the last two years?

    1. Yes

    2. No

APPENDIX D: Questionnaire.

CAREFULLY CONSIDERING THE FOLLOWING VALUES AS GUIDING PRINCIPLES IN YOUR LIFE, RANK THE IMPORTANCE OF EACH VALUE. FROM ONE TO TEN. (ONE '1'= THE MOST IMPORTANT AND TEN '10'= THE LEAST IMPORTANT).

A comfortable life (a prosperous life) _____

A world at peace (free of war and conflict) _____

Equality (equal opportunity for all) _____

Freedom (independence, free choice) _____

Happiness (content) _____

Health (free from physical or mental disease or pain) _____

Interharmony (freedom from inner conflict) _____

Mature love (sexual and spiritual intimacy) _____

Self respect (self-esteem) _____

True friendship (close companionship) _____

APPENDIX E: CORRELATIONS AMONG DEMOGRAPHIC, INDEPENDENT,AND DEPENDENT VARIABLES.

		1	2	3	4	5
1	SES	---				
2	PHYSICAL	.07	---			
3	RELAX	-.06	.22**	---		
4	REGULAR	.02	.37**	.13*	---	
5	BEHAVIOR	-.18**	.35**	.29**	.47**	---
6	STRESS	-.01	.33**	.04	.29**	.31**
7	INTERNAL	.02	.26**	.13*	.12	.06
8	CHANCE	.09	.01	-.03	-.07	.03
9	POWER	.10	.04	.06	.12	.17*
10	RHEALTH	-.05	.07	-.01	.15	.06
11	SEX	-.18**	-.20**	-.23**	.17**	.12
12	MARITAL	-.16*	.01	-.04	.07	.14*
13	INJURY	-.21**	.01	.07	.13*	.14*
14	REL	-.01	-.02	-.05	-.09	.00
15	AREA	.01	.04	-.03	.01	-.02
16	AGE	-.15*	.09	.03	.11	.12

		6	7	8	9	10
1	SES					
2	PHYSICAL					
3	RELAX					
4	REGULAR					
5	BEHAVIOR					
6	STRESS	---				
7	INTERNAL	.11	---			
8	CHANCE	.10	-.19**	---		
9	POWER	.01	-.17**	.37**	---	
10	RHEALTH	.03	-.07	-.01	.07	---
11	SEX	-.20**	-.09	-.17**	-.09	.04
12	MARITAL	.12	-.05	-.04	-.08	-.01
13	INJURY	.10	-.04	.02	-.04	.07
14	REL	.03	.04	-.04	.01	-.02
15	AREA	.01	-.07	-.08	.07	.04
16	AGE	.28**	.01	-.01	-.07	.09

* p < .01
** p < .001

APPENDIX E (continued):

		11	12	13	14	15	16
1	SES						
2	PHYSICAL						
3	RELAX						
4	REGULAR						
5	BEHAVIOR						
6	STRESS						
7	INTERNAL						
8	CHANCE						
9	POWER						
10	RHEALTH						
11	SEX	---					
12	MARITAL	.08	---				
13	INJURY	.14*	.12	---			
14	REL	-.09	.08	-.09	---		
15	AREA	.03	-.02	.04	.01	---	
16	AGE	-.09	.37**	.20**	.01	.03	---

* p < .01
** p < .001

APPENDIX F: INTERNAL HEALTH LOCUS OF CONTROL BY PHB -RELAX- BY HIGH HEALTH VALUE. [Tau C .11, p > .04]

HIGH HEALTH VALUE

INTERNAL >	LOW			HIGH	ROW
RELAX LOW 1	14 30.4	15 34.1	13 30.2	12 23.5	54 29.3
2	15 32.6	11 25.0	10 23.3	11 21.6	47 25.5
3	12 26.1	12 27.3	6 14.0	18 35.3	48 26.1
HI 4	5 10.9	6 13.6	14 32.6	10 19.6	35 19.0
COLUMN TOTAL	46 25.0	44 23.9	43 23.4	51 27.7	184 100.0

INTERNAL HEALTH LOCUS OF CONTROL BY PHB - RELAX - BY LOW HEALTH VALUE (HV). [Tau C .03, p >.39]

LOW HEALTH VALUE

INTERNAL >	LOW			HIGH	ROW
RELAX LOW 1	4 40.0	2 14.3	6 42.9	6 35.3	18 32.7
2	2 20.0	5 35.7	3 21.4	2 11.8	12 21.8
3	2 20.0	4 28.6	3 21.4	3 17.6	12 21.8
HI 4	2 20.0	3 21.4	2 14.3	6 35.3	13 23.6
COLUMN TOTAL	10 18.2	14 25.5	14 25.5	17 30.9	55 100.0

APPENDIX F: INTERNAL HEALTH LOCUS OF CONTROL BY PHB PHYSICAL BY HIGH HEALTH VALUE (HV). [Tau C .09, p > .07]

HIGH HEALTH VALUE

INTERNAL >	LOW			HIGH	ROW
PHYSICAL LOW 1	14 31.1	11 25.0	9 20.9	10 19.6	44 24.0
2	12 26.7	9 20.5	10 23.3	11 21.6	42 23.0
3	11 24.4	16 36.4	13 30.2	19 37.3	59 32.2
HI 4	8 17.8	8 18.2	11 25.6	11 21.6	38 20.8
COLUMN TOTAL	45 24.6	44 24.0	43 23.5	51 27.9	183 100.0

INTERNAL HEALTH LOCUS OF CONTROL BY PHB - PHYSICAL - BY LOW HEALTH VALUE. [Tau C .38, p < .001]

LOW HEALTH VALUE

INTERNAL >	LOW			HIGH	ROW
PHYSICAL LOW 1	4 40.0	7 50.0	2 14.3	3 17.6	16 29.1
2	5 50.0	6 42.9	4 28.6	4 23.5	19 34.5
3	0	1 7.1	5 35.7	1 5.9	7 12.7
HI 4	1 10.0	0	3 21.4	9 52.9	13 23.6
COLUMN TOTAL	10 18.2	14 25.5	14 25.5	17 30.9	55 100.0

APPENDIX G: FIVE DIMENSIONS OF PREVENTIVE HEALTH BEHAVIOR.

RELAX:	GET ENOUGH RELAXATION
	GET ENOUGH SLEEP
	AVOID OVERWORKING
PHYSICAL:	GET ENOUGH EXERCISE
	WATCH MY WEIGHT
	EAT SENSIBLY
	SPEND FREE TIME OUT OF DOORS
	LIMIT FOODS LIKE SUGAR, COFFEE, FATS, ETC
	DON'T LET THINGS GET ME DOWN
	DON'T SMOKE
REGULAR:	KEEP EMERGENCY PHONE #S NEAR THE PHONE
	HAVE A FIRST AID KIT IN THE HOME
	SEE A DOCTOR FOR A REGULAR CHECKUP
	SEE A DENTIST FOR A REGULAR CHECKUP
	WEAR A SEAT BELT WHEN IN A CAR
	DISCUSS HEALTH WITH FRIENDS, NEIGHBOURS
	AVOID CONTACT WITH DOCTORS WHEN FEELING OK
	TAKE VITAMINS
BEHAVIOR:	AVOID PARTS OF THE CITY WITH A LOT OF CRIME
	AVOID PARTS OF THE CITY WITH A LOT OF POLLUTION
	DO THINGS IN MODERATION
	AVOID GETTING CHILLED
	AVOID OVER-THE-COUNTER MEDICINES
	DESTROY OLD OR UNUSED MEDICINES
	PRAY OR LIVE BY THE PRINCIPLES OF RELIGION
	USE DENTAL FLOSS
STRESS:	CHECK THE CONDITION OF ELECTRICAL APPLIANCES,
	FIX BROKEN THINGS AROUND THE HOME RIGHT AWAY
	IGNORE HEALTH ADVICE FROM LAY FRIENDS, NEIGHBOURS

APPENDIX H: THREE DIMENSIONS OF MULTIDIMENSIONAL HEALTH LOCUS OF CONTROL.

INTERNAL: IF I GET SICK, IT IS MY OWN BEHAVIOR WHICH DETERMINES HOW SOON I GET WELL AGAIN.
I AM IN CONTROL OF MY HEALTH
WHEN I GET SICK I AM TO BLAME
THE MAIN THING WHICH AFFECTS MY HEALTH IS WHAT I MYSELF DO.
IF I TAKE CARE OF MYSELF, I CAN AVOID ILLNESS
IF I TAKE THE RIGHT ACTIONS, I CAN STAY HEALTHY

CHANCE: NO MATTER WHAT I DO, IF I AM GOING TO GET SICK, I WILL GET SICK.
MOST THINGS THAT AFFECT MY HEALTH HAPPEN TO BY ACCIDENT.
LUCK PLAYS A BIG PART IN DETERMINING HOW SOON I WILL RECOVER FROM AN ILLNESS.
MY GOOD HEALTH IS LARGELY A MATTER OF GOOD FORTUNE.
NO MATTER WHAT I DO, I'M LIKELY TO GET SICK.
IF IT'S MEANT TO BE, I WILL STAY HEALTHY.

POWER: HAVING REGULAR CONTACT WITH MY PHYSICIAN IS THE BEST WAY FOR ME TO AVOID ILLNESS.
WHENEVER I DON'T FEEL WELL, I SHOULD CONSULT A MEDICALLY TRAINED PROFESSIONAL.
MY FAMILY HAS MUCH TO DO WITH MY BECOMING SICK OR STAYING HEALTHY.
HEALTH PROFESSIONALS CONTROL MY HEALTH.
WHEN I RECOVER FROM AN ILLNESS IT'S USUALLY BECAUSE OTHER PEOPLE (i.e., doctors, family, friends) HAVE BEEN TAKING GOOD CARE OF ME.
REGARDING MY HEALTH, I CAN ONLY DO WHAT MY DOCTOR TELLS

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